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polymer compound, wherein the polymeric surface has a structure oriented in one direction.

61. (New) A mesostructured material having mesopores formed on a polymeric surface made of a polymeric compound, wherein the mesopores are oriented linearly from an end to another end of the mesostructure.

REMARKS

The claims at issue are 1, 2, 4-23, 48-52 and 55-61, with claims 1, 13, 48, 50, 55, 60 and 61 being independent. Claims 24-47, 53 and 54 have been withdrawn from consideration by the Examiner as being directed to non-elected inventions. Claim 3 has been cancelled. Claims 1, 13, 48, 50 and 55 have been amended for clarification. Support for these amendments may be found throughout the specification, the drawings and the originally filed claims. Claims 4 and 6 have been amended to reflect the cancellation of claim 3.

New claims 60 and 61 have been added. Support for claim 60 may be found throughout the specification and the claims. Support for claim 61 may be found, inter alia, in Examples 1 and 4, as well as in Figs. 1A, 1B and 11. No new matter has been added. Reconsideration of the present claims is expressly requested.

Several changes made in Applicants' last-filed amendment are objected to under 35 U.S.C. § 132. Claims 1-23, 48-52 and 55-59 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter that was not described in the specification. Also, these claims stand rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite. Specifically, the Examiner has alleged that the recitations regarding the first and second regions are new matter.

While Applicants disagree with the Examiner, Applicants have amended the independent claims to delete all references to the first and second regions. Accordingly, the section 132 objection and all section 112 rejections should be withdrawn.

Claims 1-9, 11-20, 23, 48-52 and 55-59 stand rejected under 35 U.S.C. § 102(e) as being allegedly anticipated by U.S. Patent No. 6,027,666 (Ozin). Claims 10 and 21 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Ozin in view of U.S. Patent No. 6,171,687 (Leung). Claim 22 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Ozin in view of U.S. Patent No. 4,919,810 (Itoh). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants would like to again briefly discuss some of the key features and advantages of the presently claimed invention. The present invention is directed to a mesostructured material. The mesopores in the mesostructured material are formed on a polymeric surface.

It is important to understand that the mesopores in the presently claimed invention are oriented in a single direction, i.e., the mesopores are uniaxial. For example, these mesopores may be formed on a multitude of planes parallel to the surface.¹ If all such mesopores were projected onto a single plane that is parallel to the polymeric surface, these mesopores would be substantially parallel to each other on that plane. This uniaxial orientation may be achieved via an alignment control treatment of the polymeric surface, such as a rubbing treatment, prior to the formation of the mesopores.

Ozin is directed to materials comprising stabilized luminescent silicon clusters. This reference is substantially different from the presently claimed invention.

Ozin discloses a mesostructured silica film grown on the air-water interface² and subsequently transferred to or grown on the water-polyethylene interface. However,

¹/For example, Fig. 1B shows three planes parallel to the polymeric surface on which the mesopores are formed.

²/This would result in what Ozin calls a “free standing form” at col. 6, line 12 and Example 2.

Ozin does not disclose or suggest that the molecules or polymeric chains of the polyethylene bottle are oriented in a particular direction or that the surface of the bottle is or should be subjected to an alignment control treatment. As can be clearly seen in Comparative Example 1 at pages 25 and 26 of the subject specification, when the polymeric surface is not subjected to an alignment control treatment such as a rubbing treatment, the mesopores that are formed are not oriented in a single direction.

While the mesopores of Ozin may be substantially parallel to the surface, they are not uniaxial (oriented in a single direction), i.e., the mesopores in Ozin would not be parallel to each other if projected onto a single plane that is parallel to the surface. In fact, the mesopores in Ozin are understood to be randomly oriented, since Ozin discloses a mesostructured material that is similar to the one formed in Comparative Example 1 in the subject application. Ozin is silent regarding the orientation of the mesopores with respect to each other.³

Therefore, it is clear that Ozin does not disclose or suggest a mesostructured material with uniaxial mesopores (oriented in a single direction), which are arranged on a polymeric surface made of a polymer compound whose chains or molecules are oriented in a specific direction. Further, with respect to new claim 61, Ozin fails to disclose or suggest mesopores that are linearly oriented from one end of the structure to the other end thereof. Accordingly, Ozin cannot anticipate the present invention or render it unpatentable.

The deficiencies of Ozin cannot be cured by Leung or Itoh. These references have been discussed in Applicants' response filed on March 29, 2002. This discussion is incorporated herein in its entirety. As stated in the March 29, 2002 Amendment, even if assumed, arguendo, that Leung and Itoh contain the teachings alleged by the Examiner, these references do not teach or suggest the same features of the presently

^{3/}The Examiner will appreciate that the parallel orientation of the mesopores with respect to the surface of the film does not necessarily result in a uniaxial orientation of the mesopores with respect to each other.

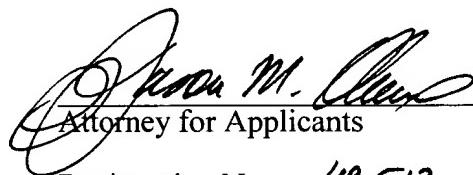
claimed invention that are missing in Ozin, i.e., a mesostructured material having uniaxial mesopores arranged on a polymeric surface made of a polymer compound whose chains or molecules are oriented in a specific direction. Thus, the presently claimed invention is patentable over Ozin, Leung and Itoh, whether these references are considered separately or in any combination.

Wherefore, Applicants respectfully request that all rejections be withdrawn and the present case passed to issue.

Applicants respectfully submit that all issues have been resolved. However, if upon reviewing the above amendments and remarks the Examiner believes that some issues still remain, the Examiner is requested to contact Applicants' undersigned attorney to schedule an interview prior to issuing another action on the merits.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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APPENDIX

Application No. 09/478,884
Attorney Docket No. 03500.014215

IN THE CLAIMS:

Claim 3 has been cancelled.

Claims 1, 4, 6, 13, 48, 50 and 55 have been amended as follows:

1. (Three Times Amended) A mesostructured material comprising[:
a first region having a polymeric surface; and
a second region provided on the polymeric surface of the first region, the
second region having tubular mesopores,
wherein the] tubular mesopores, which are oriented in [towards] a first
direction [parallel to the surface] and which are arranged on a [the] polymeric surface made
of a polymer compound whose chains or molecules are oriented in a second direction [has
been subjected to an alignment control treatment].

4. (Amended) The mesostructured material according to claim 1 [3],
wherein the first direction and the second direction are different from each other.

6. (Amended) The mesostructured material according to claim 1 [3],
wherein the polymeric surface is constituted of a Langmuir-Blodgett film.

13. (Three Times Amended) A mesostructured material comprising:
[a first region having] a polymer material surface in which chains of the
polymer material are oriented in a first direction parallel to the polymer material surface;
and

a material [second region] provided on the polymer material surface [of the
first region], the material [second region] having tubular mesopores,
wherein the tubular mesopores are oriented in a second direction nearly
perpendicular to the first direction, and the oriented tubular mesopores are formed on the
polymer material surface with [by locating] silica located outside of an oriented surfactant
micelle structure of which orientation is determined by parallel accommodation of
molecules of the surfactant on the chains of the polymer material through chemical
interaction.

48. (Three Times Amended) A mesostructured material comprising:
[a first region having] a polymeric surface; and
a material [second region] provided on the polymeric surface [of the first
region], the material [second region] having tubular mesopores,
wherein the tubular mesopores are oriented in a direction parallel to the
surface, and the direction is determined by a direction of a rubbing treatment of the
polymeric surface.

50. (Twice Amended) A mesostructured material comprising:

[a first region having] a polymeric surface comprising a polymeric compound; and

a material [second region] provided on the polymeric surface [of the first region], the material [second region] having tubular mesopores,

wherein the tubular mesopores are oriented in a direction parallel to the surface, and the direction is determined by an orientation direction of the polymeric compound's polymer chain.

55. (Twice Amended) A mesostructured material comprising:
[a first region having] a polymeric surface comprising a polymeric compound; and

a material [second region] provided on the polymeric surface [of the first region], the material [second region] having mesopores,
wherein the mesopores are oriented in a first direction parallel to the surface and the polymeric compound of the polymeric surface is oriented in a second direction.